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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/634,997	08/06/2003	Shinichi Sumida	038788.52654US	7492

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EXAMINER	
HU, HENRY S	

ART UNIT	PAPER NUMBER
1713	

DATE MAILED: 08/25/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/634,997	SUMIDA ET AL.	
	Examiner	Art Unit	
	Henry S. Hu	1713	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *Election of June 10, 2005*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-16* is/are pending in the application.

4a) Of the above claim(s) *1,3,4,6,8,10,11 and 13-16* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *2,5,7,9 and 12* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☒ Claim(s) *1-16* are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

1. It is noted that Applicants' election filed on June 10, 2005 was received. The Applicants have elected **Claims 2, 5, 7, 9 and 12 (Group II) without traverse**, which has also been confirmed with attorney **J. D. Evans** on a telephone interview on June 17, 2005. **Claims 1-16 are now pending** with a total of five independent claims (**Claims 1, 2, 3, 4 and 5**), while non-elected **Claims 1, 4, 6, 8, 11 and 14-16 (Group I) as well as Claims 3, 10 and 13 (Group III) are withdrawn from consideration**. An action follows.

Specification

2. The disclosure is objected to because of the following informalities:

On **page 18** at line 9, recitation of "oximsulfonate" is wrong and should be changed to "**oximesulfonate**". Please refer to the first same wording at the same line

Appropriate correction is required.

Claim Rejections - 35 USC § 112

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claim 2 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

On **Claim 2** (page 40 at line 7), phrase of **"the group optionally containing .....and a carbonyl bond"** is vague and indefinite because it is not clear whether it is related to Group (a), Group (b) or both. It is noted that **Group (a) (a hydrocarbon group)** and **Group (b) (an aromatic hydrocarbon group)** are involved in this group. Rewriting is needed. Otherwise, one having ordinary skill in the art may be thereby confused. It is also noted same error may be existed on Claim 1, 3 and specification.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.

2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

5. *The limitation of parent* ***Claim 2*** *in present invention relates to* ***a fluorine-containing compound*** *having a specific formula (2), wherein* R^1, R^2, R^3, *and l, m, n are as specified while* ***l is 0-2 and o is 1-8****. Parent* ***Claim 5*** *is related to a compound from Claim 2* ***when l is 0 and o is 4*** *with a specific formula (5). See other limitations of dependent* ***Claims 7, 9 and 12****.*

6. Claims 2, 5, 7 and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Farah et al. (Journal of Organic Chemistry, 30(4), 1003-1005, (1965)) in view of Hatakeyama et al. (USPG-PUB 2003/0082479 A1).

Regarding the chemical structure limitation of two parent **Claims 2 and 5**, **Farah** et al. have disclosed that **condensation of hexafluoroacetone with various mono-phenol (such as phenol and 1-naphthol) and dihydric phenol (such as 1,5-naphthalenediol) in the presence of toluenesulfonic acid as catalyst** would result in the attachment of at least one **2-hydroxyhexafluoro-2-propyl** moiety onto the aromatic rings (page 1003, abstract and introduction). Regarding using **phenol**, **2**-(2-hydroxyhexa-fluoro-2-propyl)-1-phenol and **4**-(2-hydroxyhexafluoro-2-propyl)-1-phenol, and **2,4-bis**(2-hydroxyhexafluoro-2-propyl)-1-phenol can be isolated with different yields (see Table II on page 1004, item # 1). Regarding using

1-naphthol or 1,5-naphthalenediol, similar products can be also obtained (see Table II on page 1004, item # 12 and 13). The structural architect of such fluorinated aromatic compounds would read on both the claimed ring structure and the substituting functional groups.

7. In a close examination, Farah is only silent about the preparation of the hydrogenated (or called cycloaliphatic) analogue. Hatakeyama et al. teach that in the course of making fluoropolymers having **2-hydroxyhexafluoro-2-propyl** moiety, **cycloaliphatic structure and aromatic structure in the polymers are found to be functional equivalent and interchangeable** (pages 2-3 at paragraph 0020; page 9 at right bottom to page 10 at left top). By doing so, the advantage is that a resist composition sensitive to **radiation below 200 nm wavelength** for photo-lithographic microprocessing can be obtained (abstract, line 5-8). It is noted that some hydroxyl groups may be mixed with **2-hydroxyhexafluoro-2-propyl** moiety (see page 9 at paragraph 0045).

In light of the fact that all the involving references are making and using a fluoroalcoholic compound having the same **2-hydroxyhexafluoro-2-propyl** moiety and may be mixed with some hydroxyl functional group, one having ordinary skill in the art would therefore found it obvious to modify Farah's aromatic compounds by converting it to cycloaliphatic structure, which is functionally equivalent to and interchangeable with its aromatic analogue, by hydrogenation reaction or other synthetic routes as taught by Hatakeyama, with an advantage as such a modification will make a resist composition sensitive to **radiation below 200 nm**

wavelength for photo-lithographic microprocessing. Thereby producing a persistent, reliable and diversified product.

8. Regarding **Claim 7**, various **polymerizable units** including the claimed groups in Claim 7 have been taught by Hatakeyama (see page 2 at paragraphs 12-16).

Regarding **Claim 12**, various **acid-labile protecting groups** including the claimed groups in Claim 12 have been taught by Hatakeyama (see pages 5-6 at paragraphs 30-38). Some groups contain at least one of **an oxygen atom** (see paragraph 0037) and **a carbonyl bond** (see paragraph 0035).

9. Claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over Farah et al. (Journal of Organic Chemistry, 30(4), 1003-1005) in view of Hatakeyama et al. (USPG-PUB 2003/0082479 A1) as applied to Claims 2, 5, 7 and 12, and further in view of Fedynyshyn et al. (USPG-PUB 2002/0160297 A1).

The discussion of the disclosures of the prior art of Farah/Hatakeyama for Claims 2, 5, 7 and 12 of this office action is incorporated here by reference. Regarding **Claim 9**, the combination of Farah and Hatakeyama is silent about including some claimed groups such as trifluoromethylacryloyl and the like for at least one of R^2 and R^3 on formula (2). **Fedynyshyn** et al. teach in making fluoropolymers having **2-hydroxyhexafluoro-2-propyl** moiety (paragraph 0050), **compatible copolymerizing units related to the class of vinyl, acrylate, methacrylate**

and trifluoromethacrylate are each other found to be functional equivalent and interchangeable (paragraph 0053). By doing so, the advantage is that a resist composition very sensitive to **radiation at 157 nm** can be obtained for photo-lithographic microprocessing (abstract, line 1-4). It is noted that some acid-labile protecting groups may be coupled with **2-hydroxyhexafluoro-2-propyl** moiety (paragraph 0050).

10. In light of the fact that all the involving references are making and then using a fluoroalcoholic compound having the same **2-hydroxyhexafluoro-2-propyl** moiety and may be coupled with some acid-labile protecting groups, one having ordinary skill in the art would therefore found it obvious to modify Farah/ Hatakeyama's cycloaliphatic compounds by converting the hydroxyl or fluoroalcoholic functional group to the claimed polymerizing unit(s) by some synthetic routes as taught by Fedynyshyn, with an advantage as such a modification will make a resist composition very sensitive to **radiation at 157 nm** for photo-lithographic microprocessing. Thereby producing a persistent, reliable and diversified product.

Conclusion

11. The prior art made of record and not relied upon is considered pertinent to applicants' disclosure. The following references relate to a fluorine-containing compound having a formula (2) or (5): US Patent No. **6,136,499 to Goodall** et al. discloses the preparation of photoresist compositions comprising **polycyclic polymers with acid-labile pendant groups** (title and abstract). In a close examination on the acid-labile polycyclic monomers used by Goodall, **only**

norborene type structure is involved (column 5, line 33 – column 6, line 52). Therefore, Goodall fails to teach or fairly suggest the chemical structure limitation of Claims 2 and 5 in present invention.

12. Any inquiry concerning this communication or earlier communication from the examiner should be directed to Dr. Henry S. Hu whose telephone number is **(571) 272-1103**. The examiner can be reached on Monday through Friday from 9:00 AM –5:00 PM. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Wu, can be reached on (571) 272-1114. The fax number for the organization where this application or proceeding is assigned is (703) 872-9306 for all regular communications.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Henry S. Hu

Patent Examiner, Art Unit 1713, USPTO

August 19, 2005

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